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and as the Western fishes usually called carp belong to the sucker family and are pretty well known to ichthyologists, we are somewhat surprised at the broad statement made by Mr. Roosevelt to the contrary. Then the Commissioners seem to be quite neglectful in not looking up the stock of carp which, according to a letter published in DeKay's "Fishes of New York" (p. 189), were introduced in 1831 and '32 by Henry Robinson, Esq., of Newburgh, Orange Co., N. Y. Mr. Robinson states that he put some six or seven dozen carp, which he brought from France, into his ponds, and that "they increased to a superior degree" and (in 1841) he had "more than sufficient for family use." It is hardly possible that the Robinson fish could have become exterminated, as they seem to have thrived well, and Mr. Robinson also states in his letter that "For the last four years past, I have put from one to two dozen carp every spring in the Hudson river near my residence. They have increased so much that our fishermen frequently take them in their nets. They are larger than those in my ponds." In "Frank Forester's Fish and Fishing" (1851) p. 166 an account of these carp is given, and mention made of a law of the state protecting them for five years, etc. This is certainly a matter worth looking into by the State Commissioners.

The Report closes with several characteristic letters from Mr. Green.

THE MAY FLIES.*—This elaborate work is of use to entomologists generally as it gives a list, with brief descriptions, of many foreign species, and hence will be of much use in America. It will evidently prove, when completed, to be the standard work on this interesting family, and with its excellent plates, full synonymy and many critical notes, is a great step in advance of any paper yet published on this group. The author finds that the study of alcoholic specimens is absolutely necessary for characterizing the species, as the bodies shrivel in drying. We hope the students of other groups of delicate-bodied insects will follow Mr. Eaton's excellent example, and that insects preserved in alcohol will be found in all our entomological collections.

The number of described recent species of this family is about one hundred and seventy-eight, of which fifty-three are found in

* A Monograph on the Ephemeridæ. By the Rev. A. E. Eaton. Part I. The Nomenclature of the Ephemeridæ. (From the Transactions of the Entomological Society of London, 1871.) 8vo. pp. 164, with six plates.

the United States and British North America. There are three fossil species determinable, the oldest being from the Oolite formation at Solenhofen. The author gives a list of species of fossil insects which have been at various times and by different observers referred to this family. They are from formations older than the Tertiary, mostly the Carboniferous. Among them are the strange forms described as Dictyoneura, Eugereon, Miamia, Hemeristia, Haphlophlebium, Platephemera, Homothetus, Xenoneura, Gerephemera and Lithentomum. He says that "Platephemera and Homothetus may possibly be of the Ephemeridæ, but there is nothing in the figures to make this certain, and there is no reason for considering that Xenoneura belongs to this family." He then remarks:—

"Palæontologists have adopted a ridiculous course with regard to some insect fossils. Whenever an obscure fragment of a well-reticulated insect's wing is found in a rock, a genus is straightway set up, and the fossil named as a new *species*. The species is then referred to the Ephemeridæ, and is immediately pronounced to be a synthetic type of insects, at present distantly related to one another in organization. This enunciation of synthetic types is often nothing less than a resort to random conjecture respecting the affinities of animals which the writer is at a loss to classify. An insect allied to the Ephemeridæ which chirped like a Locust (such as Xenoneura is imagined to have been) is a tolerable sample of these synthetic types. When a fossil comprises only a fragment, or even a complete wing of an Ephemerid, it is hardly possible to determine the *genus*, and impossible to assert the *species*. The utmost that can be learned from such a specimen is the approximate relations of the insect. Neuration by itself is not sufficient to define the species or even the genera of recent Ephemeridæ.

This criticism on the labors of palæontologists seems to us, considering the great difficulties of the subject they have to deal with, scarcely fair, though perhaps in part deserved. That synthetic, or comprehensive, or generalized types exist among the vertebrates, as for instance the Archæopteryx, the pterodactyles, the palæozoic fishes; and others among the radiates and molluscs, our critic would not probably deny. And among the palæozoic insects, genera such as Eugereon, Dictyoneura, and Palephemera, are not considered as generalized types simply as a device of the puzzled and distracted entomologist for a means of escape from coming to any decision. These "random conjectures" are, if such, due to the

singularly comprehensive character of many of the fossil remains of Carboniferous and Devonian times; and it is by the study of these fragments of wings that we are gradually coming to a better knowledge of the links uniting the families of the Neuroptera (in the Linnæan sense) and that the great differences in opinion between entomologists regarding the classification and position in nature of the Orthoptera and Neuroptera are to be settled. We would inquire what would recent zoology be without the "obscure fragments" left us of Palæozoic life? The inference forced upon us from their study is that the earlier forms of life were more generalized than now, and thus, in all probability, were the primitive stock or ancestral forms, which have been by evolution differentiated into the forms now living.

We would inquire also whether one is not safe, or whether it would not be safer in practice, to consider a fragment of a Palæozoic, or earlier Mesozoic insect's wing as belonging to a different species or genus from any now living, if the fragment does actually differ from corresponding portions of any living species with which it may be compared?

We quote the following useful remarks on the preservation of these insects for study. "In drying, the color and form of Ephemeridæ soon change. Color is of little importance, even in fresh examples; but form is necessary to the distinguishing of the species. They are, therefore, best preserved in a liquid. It is sufficient for ordinary purposes to dip the freshly killed specimen into dilute spirits, and then transfer it to a tube, or homœopathic globule bottle, partly filled with water. Next, Price's glycerine is added to the water—one or two drops a day—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould. The name of the species may be written on the disk of the cork, the date and locality of capture round its side. Hind-wings of the species of *Baetis* and *Centroptilum* should be mounted on slips of grass, for microscopical examination. Pinned specimens are often difficult to determine, in consequence of their shrinking; to card them is to render them fit for nothing."

Why does our author always call the larva a "nymph?" Does not this term apply to the pupa alone? The remarks on the principal points to be studied in the young and adult of these insects are capital.

ARRANGEMENT OF THE FAMILIES OF MOLLUSKS.* — This list of the families, orders and classes of mollusks, "prepared at the request of the Smithsonian Institution, for the purpose of facilitating the arrangement and classification of the mollusks and shells of the National Museum" is an exceedingly useful one, and every conchologist will find it indispensable in arranging his specimens. Dr. Gill states in the introduction, that "it must be considered simply as a provisional list, embracing the results of the most recent and approved researches into the systematic relations and anatomy of those animals, but from which, innovations and peculiar views, affecting materially the classification, have been excluded."

Those who have attempted the compilation even of a list of the groups of a class or higher division, know well enough the difficulties attending its preparation, and our author has not attempted it without giving the result of researches covering a number of years. He is assisted in some groups by Mr. Dall. Dr. Gill admits the division of the mollusks into two primary groups, the *Mollusca vera* and *Molluscoidea*, the latter embracing the Brachiopoda and Polyzoa.

Now that several continental zoologists, among them Leuckart and Gegenbaur, have placed the Polyzoa among the worms, and Prof. Morse has considered the Brachiopods as a division of Annelids, a change alluded to by Dr. Gill, the time may come when these two classes will not be mentioned in conchological works.

But as it will be long before such revolutionary views, should they prove correct, will be adopted, it is most expedient in such an arrangement as this to let them go under the provisional name of *Molluscoidea*.

Malacologists will be interested in the remarks on the different groups, the classes, orders, etc., containing as they do many valuable suggestions as to the general classification of the subkingdom. We trust that similar lists will be prepared by specialists in other departments, and published by the Smithsonian Institution.

ASYMMETRY IN INSECTS.† — While many of the molluscs are fair examples of asymmetrical animals, as seen in the shells as well as

* Arrangement of the Families of Mollusks. By Theodore Gill, M. D. Smithsonian Miscellaneous Collections. 227. Washington, D. C. Feb. 8, 1871. 8vo. pp. 65.

† On Asymmetry in the Appendages of Hexapod Insects. By S. H. Scudder and E. Burgess. (From the Proceedings of the Boston Society of Natural History.) 1871. 8vo, pp. 24, with a plate.

the bodies of these animals, and while in most of the radiates it is difficult to detect any line dividing their body into halves, the insects, and indeed all the articulates, are as a rule symmetrical, one-half of the body, together with its appendages, exactly repeating the opposite. As our authors remark, however, some of the Crustacea are asymmetrically developed, and they give as examples, the entire body of Bopyrus and Peltogaster, low parasitic forms, and the claws of many Decapods, such as the lobster and many species of shrimps. They further remark :—

“We are not aware that any cases of asymmetry have been recorded among the worms ; and certainly very few among insects ; there are occasionally slight differences in the right and left mandibles of some mandibulates [such as beetles], and Coccus has recently been referred to by Gerstaecker as an example of asymmetry, without further specification ; we have been unable to discover to what he refers. Loew, also, in the first of his monographs of the North American Diptera, states that the hypopygium (the external genital armature) of the males of Syrphidæ and Pipunculidæ is unsymmetrical.”

A figure of this organ, belonging to a species of fly, *Phora*, is given in illustration, with the left clasp very much stouter and somewhat longer than the right one.

In studying the external genital organs of the males of *Nisoniades*, a genus of butterflies belonging to the skippers, a most remarkable asymmetry was detected between the opposite clasps of the same individual. This is found more or less marked in all the species yet known, the left clasp “with some minor exceptions,” being always more highly developed than the right.

It is difficult to account for this asymmetry. The males are much more numerous than the other sex, and the authors are inclined to think that “the excessive development of these parts in the male, is in correlation with their superior numbers, ensuring beyond doubt, the impregnation of every female ; we do not, however, see how asymmetry gives any superior advantage.” A description of these parts in the different species follows, and eleven new species are described. It is a pity that other than these secondary sexual characters were not added for the better discrimination of the species of so large and difficult a genus—but further descriptions of the new forms are probably reserved for another occasion.